

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) An image processing apparatus comprising:
a conversion means for generating a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;
a reduced image generation means for generating a reduced image from the tone-converted image based on a logarithmic luminance $\log L(p)$ of a frame;
a smoothing means for generating a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image; and
~~correction information acquisition means for acquiring correction information of the frame based on the reduced image; and~~
a grayscale conversion means for generating a contrast-corrected image based on luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g ,
wherein gain value g is determined by an inverse number of a gradient of a tone curve, converting grayscale of the frame;
~~wherein the grayscale conversion means corrects contrast of the frame using the correction information, as a processing to be performed before and/or after the grayscale is converted.~~
2. (Canceled)

3. (Currently amended) The image processing apparatus according to claim 1, further comprising:

~~smoothing means for generating a smoothed image having luminance L_c of pixels composing the frame smoothed based on interpolation calculation using pixels composing the reduced image; and~~

~~a gain value setting means for setting a the gain value g , used for correcting the contrast;~~

~~wherein the grayscale conversion means generates a contrast corrected image based on luminance L_c of pixels composing the frame, luminance L_1 of pixels composing the smoothed image, and a predetermined gain value g ; and~~

the gain value setting means can be configured so as to set the gain value g based on input initial gain value g_0 , reference gain value 1, and an attenuation value $\text{attn}(\text{Th}_1, \text{Th}_2, L_c)$ calculated using a first luminance threshold value Th_1 , a second luminance threshold value Th_2 , and luminance L_c of pixels comprising composing the first input image frame.

4. (Currently amended) The image processing apparatus according to claim 1, further comprising:

~~conversion means for generating a tone converted image by converting luminance L of pixels composing the frame based on a conversion function;~~

~~smoothing means for generating a smoothed image by smoothing luminance L_c of pixels composing the tone converted image; and~~

a gain value setting means for setting a the gain value g ~~used for correcting the~~
~~contrast~~ based on an initial gain value g_0 which expresses an inverse $1/\gamma$ of a slope γ of
the conversion function₁[[;]]

~~wherein the contrast correction means generates a contrast corrected image~~
~~based on luminance L_c of pixels composing the tone converted image, luminance L_1 of~~
~~pixels composing the smoothed image, and a gain value g ; and~~

the gain value setting means sets the gain value g based on ~~input~~ the initial gain
value g_0 , a reference gain value 1, and an attenuation value $\text{attn}(\text{Th}_1, \text{Th}_2, L_c)$ calculated
using a first luminance threshold value Th_1 , a second luminance threshold value Th_2 ,
and luminance L_c of pixels comprising ~~composing~~ the tone-converted image.

5. (Currently amended) The image processing apparatus according to claim 1,
further comprising:

~~wherein the reduced image generation means generates a reduced image by~~
~~converting the frame into a tone converted image based on a conversion function and~~
~~reducing a size of the tone converted image;~~

the a correction information acquisition means for acquiring ~~acquires~~ correction
information including a slope of the conversion function₁; ~~and~~

wherein the grayscale conversion means generates the contrast-corrected image
~~corrects contrast of the tone converted image based on the reduced image and the~~
slope of the conversion function.

6. (Canceled)

7. (Currently amended) The image processing apparatus according to claim 5,
further comprising:

a hold means for holding the reduced image ~~generated by the reduced image generation means~~ and the correction information ~~acquired by the correction means~~;

wherein the hold means holds the reduced image corresponding to a ~~previous frame's~~ the first input image and a slope of the conversion function applied to the ~~previous frame's first input image~~, and the grayscale conversion means generates a contrast-corrected image of a second input image ~~corrects the contrast of the tone-converted image~~ based on the reduced image of the first input image ~~previous frame~~ and the slope of the conversion function applied to the first input image, both stored in the hold means.

8. (Currently amended) An image processing method comprising:

generating a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;

generating a reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image a frame;

generating a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image;

acquiring a correction information of the frame based on the reduced image; and

generating a contrast-corrected image based on the correction information, luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g .

wherein gain value g is determined by an inverse number of a gradient of a tone curve.

~~converting grayscale of the frame;~~
~~wherein the grayscale conversion step corrects contrast of the frame using the~~
~~correction information, as a processing to be performed before and/or after the~~
~~grayscale is converted.~~

9. (New) The image processing apparatus according to claim 1, wherein the reduced image generation means generates the reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image.

10. (New) An image processing apparatus comprising:
a conversion unit configured to generate a tone-converted image by converting luminance L_1 of pixels comprising a first input image based on a conversion function;
a reduced image generation unit configured to generate a reduced image from the tone-converted image;
a smoothing unit configured to generate a smoothed image having luminance L_c of pixels comprising the first input image based on an interpolation calculation using pixels comprising the reduced image; and
a grayscale conversion unit configured to generate a contrast-corrected image based on luminance L_c of pixels comprising the first input image, luminance L_1 of pixels comprising the smoothed image, and a predetermined gain value g ,

wherein gain value g is determined by an inverse number of a gradient of a tone curve.

11. (New) The image processing apparatus according to claim 10, wherein the reduced image generation unit is configured to generate the reduced image based on a logarithmic luminance $\log L(p)$ of the tone-converted image.